SAR TEST REPORT

FCC 47 CFR § 2.1093
IEEE Std 1528-2013

for

Cellular Emergency Alarm System

Model Name.: Mobile Lite-R32

Prepared for:

CLIMAX TECHNOLOGY CO., LTD.
No.258, Sinhu 2nd Rd., Neihu District, Taipei City 114, Taiwan

Prepared by

Compliance Certification Services Inc.
Wugu Lab.
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Issue Date: April 12, 2022

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Revision History

Rev.	Issue Date	Revisions	Revised By
00	March 25, 2022	Initial Issue	Doris Chu
01	April 12, 2022	See the following Note Rev. (01)	Doris Chu

Rev. (01)
1.Revised FCC ID.

Table of Contents

1 Attestation of Test Results

Applicant Name	Cellular Emergency Alarm System	
Model Name	Mobile Lite-R32	
Applicable Standards	FCC 47 CFR § 2.1093 Published RF exposure KDB procedures IEEE Std 1528-2013	
Exposure Category	SAR Limits (W/Kg)	
	Peak spatial-average (1g of tissue)	Extremities (hands, wrists, ankles, etc.) (10g of tissue)
General population	1.6	4
RF Exposure Conditions	Equipment Class - Highest Reported SAR (W/kg)	
	PCE	
Head	0.67	
Extremity	3.067	
Receive EUT Date:	February 24, 2022	
Date Tested	March 9 ~ 15, 2022	
Test Results	Pass	

Compliance Certification Services Inc. , tested the above equipment in accordance with the requirements set forth in the above standards. Determination of compliance is based on the results of the compliance measurement,not taking into account measurement instrumentation uncertainy.All indications of Pass/Fail in this report are opinions expressed by Compliance Certification Services Inc, based on interpretations and/or observations of test results. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Approved & Released By:	Tested by:
	
Kevin Tsai Deputy Manager Compliance Certification Services Inc.	Sky Zhou Asst. Section Manager Compliance Certification Services Inc.

2 Test Specification, Methods and Procedures

The tests documented in this report were performed in accordance with FCC 47 CFR § 2.1093, IEEE STD 1528-2013, the following FCC Published RF exposure KDB procedures:

- 447498 D01 General RF Exposure Guidance v07
- 865664 D01 SAR measurement 100 MHz to 6 GHz v01r04
- 865664 D02 RF Exposure Reporting v01r02
- 941225 D01 3G SAR Procedures v03r01
- 941225 D05 SAR for LTE Devices v02r05

3 Device Under Test (DUT) Information

3.1 DUT Description

Applicant Name	CLIMAX TECHNOLOGY CO., LTD.
Applicant Address	No.258, Sinhu 2nd Rd., Neihu District, Taipei City 114, Taiwan
Manufacturer Name	CLIMAX TECHNOLOGY CO., LTD.
Manufacturer Address	No.258, Sinhu 2nd Rd., Neihu District, Taipei City 114, Taiwan
Product	Cellular Emergency Alarm System
Trade Name	CLIMAX
Model No.	Mobile Lite-R32
Model Discrepancy	N/A
Device Dimension	Overall (Length x Width): 57 mm x 34 mm Overall Diagonal: 62 mm
Back Cover	☐ Normal Battery Cover ☐ Normal Battery Cover with NFC ☐ Wireless Charger Battery Cover ☐ Wireless Charger Battery Cover with NFC ☒ The Back Cover is not removable.
Battery Options	☒ Standard – Lithium-ion battery, Rating 3.7Vdc, 530mAh ☐ Extended (large capacity) ☐ The rechargeable battery is not user accessible.
Accessory	Belt Clip sling
Hardware Version	V1.2
Software Version	0.0.23
Sample Stage	PVT

3.2 Wireless Technologies

Wireless technologies	Frequency bands	Peak Antenna Gain (dBi)	Operating mode	Duty Cycle used for SAR testing
W-CDMA (UMTS)	Band II Band IV Band V	-1.52 1.53 -3.63	UMTS Rel. 99 (Voice & Data) HSDPA (Rel. 5) HSUPA (Rel. 6)	100%
LTE	FDD Band 2 FDD Band 4 FDD Band 5 FDD Band 12 FDD Band 13	-1.52 1.53 -3.63 -10.51 -5.6	QPSK 16QAM(only supports up to 25%RB)	100% (FDD)
		Does this device support SV-LTE (1xRTT-LTE)? ☐ Yes ☒ No		
Antenna Specification	Type	Monopole		

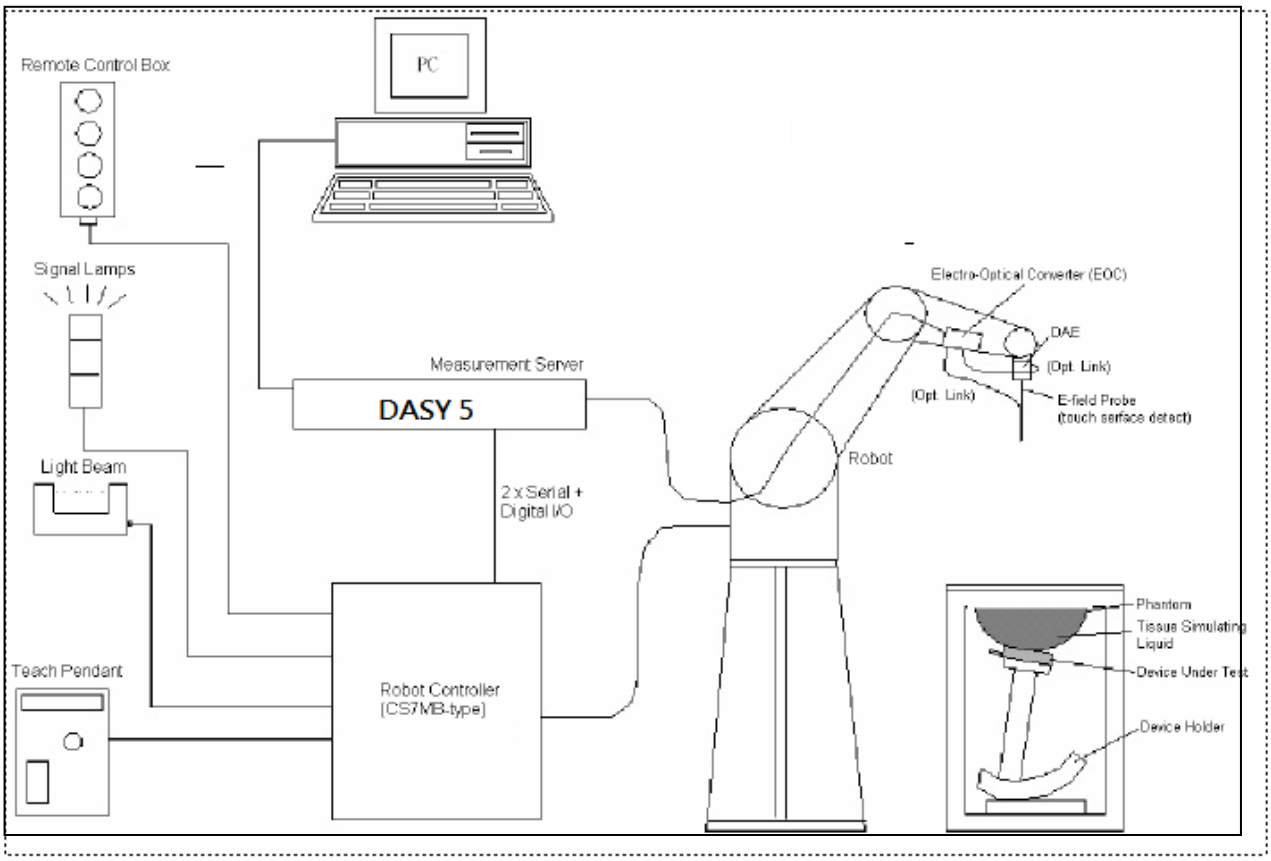
Notes:

1. The sample selected for test was prototype that representative to production product and was provided by manufacturer
2. Variant information between/among model numbers / trademarks is provided by the applicant, test results of this report are applicable to the sample EUT received of main test model name.
3. Antenna information is provided by the applicant, test results of this report are applicable to the sample EUT received

3.3 General LTE SAR Test and Reporting Considerations

<table>
<tr><th>Item</th><th colspan="7">Description</th></tr>
<tr><td rowspan="20">Frequency range, Channel Bandwidth, Numbers and Frequencies</td><td rowspan="2">Band 2</td><td colspan="6">Frequency range: 1850 - 1910 MHz</td></tr>
<tr><td colspan="6">Channel Bandwidth</td></tr>
<tr><td></td><td>20 MHz</td><td>15 MHz</td><td>10 MHz</td><td>5 MHz</td><td>3 MHz</td><td>1.4 MHz</td></tr>
<tr><td>Low</td><td>18700/ 1860</td><td>18675/ 1857.5</td><td>18650/ 1855</td><td>18625/ 1852.5</td><td>18615/ 1851.5</td><td>18607/ 1850.7</td></tr>
<tr><td>Mid</td><td>18900/ 1880</td><td>18900/ 1880</td><td>18900/ 1880</td><td>18900/ 1880</td><td>18900/ 1880</td><td>18900/ 1880</td></tr>
<tr><td>High</td><td>19100/ 1900</td><td>19125/ 1902.5</td><td>19150/ 1905</td><td>19175/ 1907.5</td><td>19185/ 1908.5</td><td>19193/ 1909.3</td></tr>
<tr><td rowspan="2">Band 4</td><td colspan="6">Frequency range: 1710 - 1755 MHz</td></tr>
<tr><td colspan="6">Channel Bandwidth</td></tr>
<tr><td></td><td>20 MHz</td><td>15 MHz</td><td>10 MHz</td><td>5 MHz</td><td>3 MHz</td><td>1.4 MHz</td></tr>
<tr><td>Low</td><td>20050/ 1720</td><td>20025/ 1717.5</td><td>20000/ 1715</td><td>19975/ 1712.5</td><td>19965/ 1711.5</td><td>19957/ 1710.7</td></tr>
<tr><td>Mid</td><td>20175/ 1732.5</td><td>20175/ 1732.5</td><td>20175/ 1732.5</td><td>20175/ 1732.5</td><td>20175/ 1732.5</td><td>20175/ 1732.5</td></tr>
<tr><td>High</td><td>20300/ 1745</td><td>20325/ 1747.5</td><td>20350/ 1750</td><td>20375/ 1752.5</td><td>20385/ 1753.5</td><td>20393/ 1754.3</td></tr>
<tr><td rowspan="2">Band 5</td><td colspan="6">Frequency range: 824 - 849 MHz (BW = 25 MHz)</td></tr>
<tr><td colspan="6">Channel Bandwidth</td></tr>
<tr><td></td><td>20 MHz</td><td>15 MHz</td><td>10 MHz</td><td>5 MHz</td><td>3 MHz</td><td>1.4 MHz</td></tr>
<tr><td>Low</td><td></td><td></td><td>20450/ 829</td><td>20425/ 826.5</td><td>20415/ 825.5</td><td>20407/ 824.7</td></tr>
<tr><td>Mid</td><td></td><td></td><td>20525/ 836.5</td><td>20525/ 836.5</td><td>20525/ 836.5</td><td>20525/ 836.5</td></tr>
<tr><td>High</td><td></td><td></td><td>20600/ 844</td><td>20625/ 846.5</td><td>20635/ 847.5</td><td>20643/ 848.3</td></tr>
<tr><td rowspan="2">Band 12</td><td colspan="6">Frequency range: 698 - 716 MHz</td></tr>
<tr><td colspan="6">Channel Bandwidth</td></tr>
<tr><td></td><td>20 MHz</td><td>15 MHz</td><td>10 MHz</td><td>5 MHz</td><td>3 MHz</td><td>1.4 MHz</td></tr>
<tr><td>Low</td><td></td><td></td><td>23060/ 704</td><td>23035/ 701.5</td><td>23025/ 700.5</td><td>23017/ 699.7</td></tr>
<tr><td>Mid</td><td></td><td></td><td>23095/ 707.5</td><td>23095/ 707.5</td><td>23095/ 707.5</td><td>23095/ 707.5</td></tr>
<tr><td>High</td><td></td><td></td><td>23130/ 711</td><td>23155/ 713.5</td><td>23165/ 714.5</td><td>23173/ 715.3</td></tr>
<tr><td rowspan="2">Band 13</td><td colspan="6">Frequency range: 777 - 787 MHz</td></tr>
<tr><td colspan="6">Channel Bandwidth</td></tr>
<tr><td></td><td>20 MHz</td><td>15 MHz</td><td>10 MHz</td><td>5 MHz</td><td>3 MHz</td><td>1.4 MHz</td></tr>
<tr><td>Low</td><td></td><td></td><td></td><td>23205/ 779.5</td><td></td><td></td></tr>
<tr><td>Mid</td><td></td><td></td><td>23230/ 782</td><td>23230/ 782</td><td></td><td></td></tr>
<tr><td>High</td><td></td><td></td><td></td><td>23255/ 784.5</td><td></td><td></td></tr>
<tr><td>Maximum power reduction (MPR)</td><td colspan="7">
Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3
<table>
<tr><th rowspan="2">Modulation</th><th colspan="6">Channel bandwidth / Transmission bandwidth (N_{RB})</th><th rowspan="2">MPR (dB)</th></tr>
<tr><th>1.4 MHz</th><th>3.0 MHz</th><th>5 MHz</th><th>10 MHz</th><th>15 MHz</th><th>20 MHz</th></tr>
<tr><td>QPSK</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 1</td></tr>
<tr><td>16 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 1</td></tr>
<tr><td>16 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 2</td></tr>
<tr><td>64 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 2</td></tr>
<tr><td>64 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 3</td></tr>
<tr><td>256 QAM</td><td colspan="6">≥ 1</td><td>≤ 5</td></tr>
</table>
MPR Built-in by design
The manufacturer MPR values are always within the 3GPP maximum MPR allowance but may not follow the default MPR values.
A-MPR (additional MPR) was disabled during SAR testing
</td></tr>
<tr><td>Spectrum plots for RB configurations</td><td colspan="7">A properly configured base station simulator was used for the SAR and power measurements; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report</td></tr>
</table>

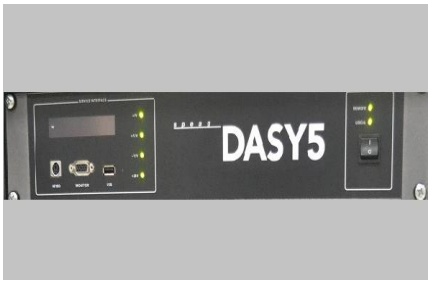
4 SAR Measurement System



The DASY5 system for performing compliance tests consists of the following items:

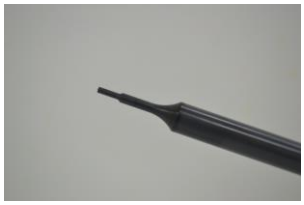
- A standard high precision 6-axis robot (St¨aubli RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion between optical and electrical of the signals for the digital communication to the DAE and for the analog signal from the optical surface detection. The EOC is connected to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
- A computer operating Windows 7 or Windows XP.
- DASY software version: NEO52 D10.3 S14.6.13.
- Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- The SAM twin phantom enabling testing left-hand and right-hand usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- Validation dipole kits allowing validating the proper functioning of the system.

4.1 System Components

DASY5 Measurement Server	
	The DASY5 measurement server is based on a PC/104 CPU board with a 166MHz low-power Pentium, 32MB chip disk and 64MB RAM. The necessary circuits for communication with either the DAE4 electronic box as well as the 16-bit AD-converter system for optical detection and digital I/O interface are contained on the DASY5 I/O-board, which is directly connected to the PC/104 bus of the CPU board. The measurement server performs all real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operation.
	The PC-operating system cannot interfere with these time critical processes. All connections are supervised by a watchdog, and disconnection of any of the cables to the measurement server will automatically disarm the robot and disable all program-controlled robot movements. Furthermore, the measurement server is equipped with two expansion slots which are reserved for future applications. Please note that the expansion slots do not have a standardized pinout and therefore only the expansion cards provided by SPEAG can be inserted. Expansion cards from any other supplier could seriously damage the measurement server. Calibration: No calibration required.

Data Acquisition Electronics (DAE)	
	The data acquisition electronics (DAE4) consists of a highly sensitive electrometer grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock. The mechanical probe mounting device includes two different sensor systems for frontal and sideways probe contacts. They are used for mechanical surface detection and probe collision detection. The input impedance of the DAE4 box is 200MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

EX3DV4 Isotropic E-Field Probe for Dosimetric Measurements



Construction: Symmetrical design with triangular core
Built-in shielding against static charges
PEEK enclosure material (resistant to organic solvents, e.g., DGBE)

Calibration: Basic Broad Band Calibration in air: 10-3000 MHz. Conversion Factors (CF) for HSL 900 and HSL 1800 CF-Calibration for other liquids and frequencies upon request.

Frequency: 10 MHz to > 6 GHz; Linearity: ± 0.2 dB (30 MHz to 3 GHz)

Directivity: ± 0.3 dB in HSL (rotation around probe axis)
± 0.5 dB in HSL (rotation normal to probe axis)

Dynamic Range: 10 µW/g to > 100 mW/g; Linearity: ± 0.2 dB (noise: typically < 1 µW/g)

Dimensions: Overall length: 330 mm (Tip: 20 mm)
Tip diameter: 2.5 mm (Body: 12 mm)
Distance from probe tip to dipole centers: 1 mm

Application: High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%.

SAM Phantom

Construction: The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE1528: 2013. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points with the robot.

Shell Thickness: 2 ±0.2 mm

Filling Volume: Approx. 25 liters

Dimensions: Height: 810mm; Length: 1000mm; Width: 500mm

ELI Phantom

Construction: Phantom for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI4 is fully compatible with the latest draft of the standard IEEE1528: 2013 and all known tissue simulating liquids. ELI4 has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is supported by software version DASY5 and higher and is compatible with all SPEAG dosimetric probes and dipoles

Shell Thickness: 2.0 ± 0.2 mm (sagging: <1%)

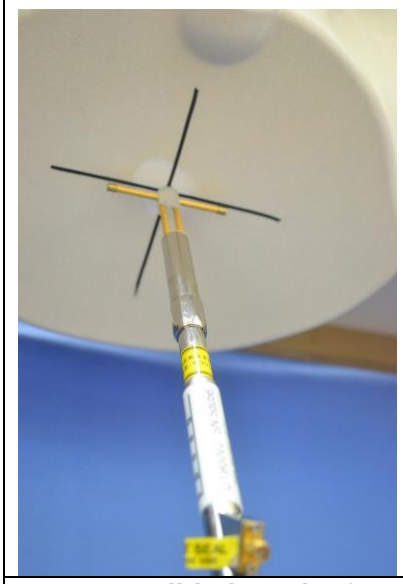
Filling Volume: Approx. 25 liters

Dimensions: Major ellipse axis: 600 mm
Minor axis: 400 mm 500mm

Device Holder for SAM Twin Phantom

Construction: In combination with the Twin SAM Phantom V4.0 or Twin SAM, the Mounting Device (made from POM) enables the rotation of the mounted transmitter in spherical coordinates, whereby the rotation point is the ear opening. The devices can be easily and accurately positioned according to IEC, IEEE, CENELEC, FCC or other specifications. The device holder can be locked at different phantom locations (left head, right head, and flat phantom).

System Validation Kits for SAM Phantom



Construction: Symmetrical dipole with l/4 balun Enables measurement of feedpoint impedance with NWA Matched for use near flat phantoms filled with brain simulating solutions Includes distance holder and tripod adaptor.

Frequency: 2450, 5300, 5600, 5800 MHz

Return loss: > 20 dB at specified validation position

Power capability: > 100 W (f < 1GHz); > 40 W (f > 1GHz)

Dimensions: D2450V2: dipole length: 51.5 mm; overall height: 290 mm
D5GHzV2: dipole length: 20.6 mm; overall height: 300 mm

System Validation Kits for ELI phantom

Construction: Symmetrical dipole with l/4 balun Enables measurement of feedpoint impedance with NWA Matched for use near flat phantoms filled with brain simulating solutions Includes distance holder and tripod adaptor.

Frequency: 2450, 5300, 5600, 5800 MHz

Return loss: > 20 dB at specified validation position

Power capability: > 100 W (f < 1GHz); > 40 W (f > 1GHz)

Dimensions: D2450V2: dipole length: 51.5 mm; overall height: 290 mm
D5GHzV2: dipole length: 20.6 mm; overall height: 300 mm

4.2 SAR Scan Procedures

Step 1: Power Reference Measurement

The reference and drift jobs are useful jobs for monitoring the power drift of the device under test in the batch process. Both jobs measure the field at a specified reference position, at a selectable distance from the phantom surface. The reference position can be either the selected section's grid reference point or a user point in this section. The reference job projects the selected point onto the phantom surface, orients the probe perpendicularly to the surface, and approaches the surface using the selected detection method.

Step 2: Area Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum locations even in relatively coarse grids. When an Area Scan has measured all reachable points, it computes the field maximal found in the scanned area, within a range of the global maximum. The range (in dB) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE1528 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan). If only one Zoom Scan follows the Area Scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of Zoom Scans has to be increased accordingly.

Area Scan Parameters extracted from KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz

<table>
<tr><th></th><th>≤ 3 GHz</th><th>> 3 GHz</th></tr>
<tr><td>Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface</td><td>5 ± 1 mm</td><td>½·δ·ln(2) ± 0.5 mm</td></tr>
<tr><td>Maximum probe abgle from probe axis to phantom surface normal at the measurement location</td><td>30° ± 1°</td><td>20° ± 1°</td></tr>
<tr><td rowspan="2">Maximum area scan spatial resolution: ΔxZoom, ΔyZoom</td><td>≤ 2 GHz: ≤ 15 mm
2 – 3 GHz: ≤ 12 mm</td><td>3 – 4 GHz: ≤ 12 mm
4 – 6 GHz: ≤ 10 mm</td></tr>
<tr><td colspan="2">When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.</td></tr>
</table>

Step 3: Zoom Scan

Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The Zoom Scan measures points (refer to table below) within a cube whose base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the Zoom Scan evaluates the averaged SAR for 1 g and 10 g and displays these values next to the job's label.

- Zoom Scan Parameters extracted from KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz

<table>
<tr><td colspan="3"></td><td>≤ 3 GHz</td><td>> 3 GHz</td></tr>
<tr><td colspan="3">Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}</td><td>≤ 2 GHz: ≤ 8 mm
2 – 3 GHz: ≤ 5 mm</td><td>3 – 4 GHz: ≤ 5 mm
4 – 6 GHz: ≤ 4 mm</td></tr>
<tr><td rowspan="3">Maximum zoom scan spatial resolution, normal to phantom surface</td><td colspan="2">Uniform grid: $\Delta z_{Zoom}(n)$</td><td>≤ 5 mm</td><td>3 – 4 GHz: ≤ 4 mm
4 – 5 GHz: ≤ 3 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td rowspan="2">graded grid</td><td>$\Delta z_{Zoom}(1)$:between 1st two points losest to phantom surface</td><td>≤ 4 mm</td><td>3 – 4 GHz: ≤ 3 mm
4 – 5 GHz: ≤ 2.5 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td>$\Delta z_{Zoom}(n>1)$: between subsequent points</td><td colspan="2">≤ 1.5·$\Delta z_{Zoom}(n-1)$</td></tr>
<tr><td>Maximum zoom scan volume</td><td>x, y, z</td><td>≥ 30 mm</td><td colspan="2">3 – 4 GHz: ≥ 28 mm
4 – 5 GHz: ≥ 25 mm
5 – 6 GHz: ≥ 22 mm</td></tr>
</table>

Step 4: Power drift measurement

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1

Step 5: Z-Scan (FCC only)

The Z Scan measures points along a vertical straight line. The line runs along the Z-axis of a one-dimensional grid. In order to get a reasonable extrapolation the extrapolated distance should not be larger than the step size in Z-direction

5 Measurement Uncertainty

Per KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg and the measured 10-g SAR within a frequency band is < 3.75 W/kg. The expanded SAR measurement uncertainty must be ≤ 30%, for a confidence interval of k = 2. If these conditions are met, extensive SAR measurement uncertainty analysis described in IEEE1528: 2013 is not required in SAR reports submitted for equipment approval.

Therefore, the measurement uncertainty is not required.

6 RF Exposure Conditions (Test Configurations)

Refer to Appendixes 1 for the specific details of the antenna-to-antenna and antenna-to-edge(s) distances.

6.1 Standalone SAR Test Exclusion Considerations

Since the Dedicated Host Approach is applied, the SAR-based exemption in Appendix B of KDB 447498 is applied together with KDB 616217 § 4.3 to determine the minimum test separation distance:

- When the separation distance from the antenna to an adjacent edge is ≤ 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.
- When the separation distance from the antenna to an adjacent edge is > 5 mm, the actual antenna-to-edge separation distance is applied to determine SAR test exclusion.

Head

SAR Test Exclusion Calculations for 0.3 GHz ≤ *f* < 1.5 GHz

Tx Interface	Frequency (GHz)	Output Power		Separation Distances (cm)	P_{th}(mW)	Exemption result
		dBm	mW	Front	Front	Front
WCDMA Band V	0.8466	24.00	251	0.5	9	-MEASURE-
LTE Band 5	0.844	24.00	251	0.5	9	-MEASURE-
LTE Band 12	0.711	24.00	251	0.5	12	-MEASURE-
LTE Band 13	0.782	24.00	251	0.5	10	-MEASURE-

SAR Test Exclusion Calculations for 1.5 GHz ≤ *f* ≤ 6 GHz

Tx Interface	Frequency (GHz)	Output Power		Separation Distances (cm)	P_{th}(mW)	Exemption result
		dBm	mW	Front	Front	Front
WCDMA Band II	1.9076	23.00	200	0.5	3	-MEASURE-
WCDMA Band IV	1.7526	23.00	200	0.5	4	-MEASURE-
LTE Band 2	1.9	23.50	224	0.5	3	-MEASURE-
LTE Band 4	1.745	23.00	200	0.5	4	-MEASURE-

Extremities

SAR Test Exclusion Calculations for 0.3 GHz ≤ *f* < 1.5 GHz

Tx Interface	Frequency (GHz)	Output Power		Separation Distances (cm)					P_{th}(mW)					Exemption result				
		dBm	mW	Rear	Edge1	Edge2	Edge3	Edge4	Rear	Edge1	Edge2	Edge3	Edge4	Rear	Edge1	Edge2	Edge3	Edge4
WCDMA Band V	0.8466	24.00	251	1.2	0.5	4.2	0.5	0.5	8	2	47	2	2	-MEASURE-	-MEASURE-	-MEASURE-	-MEASURE-	-MEASURE-
LTE Band 5	0.844	24.00	251	1.2	0.5	4.2	0.5	0.5	8	2	47	2	2	-MEASURE-	-MEASURE-	-MEASURE-	-MEASURE-	-MEASURE-
LTE Band 12	0.711	24.00	251	1.2	0.5	4.2	0.5	0.5	9	3	47	3	3	-MEASURE-	-MEASURE-	-MEASURE-	-MEASURE-	-MEASURE-
LTE Band 13	0.782	24.00	251	1.2	0.5	4.2	0.5	0.5	8	3	47	3	3	-MEASURE-	-MEASURE-	-MEASURE-	-MEASURE-	-MEASURE-

SAR Test Exclusion Calculations for 1.5 GHz ≤ *f* ≤ 6 GHz

Tx Interface	Frequency (GHz)	Output Power		Separation Distances (cm)					P_{th}(mW)					Exemption result				
		dBm	mW	Rear	Edge1	Edge2	Edge3	Edge4	Rear	Edge1	Edge2	Edge3	Edge4	Rear	Edge1	Edge2	Edge3	Edge4
WCDMA Band II	1.9076	23.00	200	1.2	0.5	4.2	0.5	0.5	4	1	46	1	1	-MEASURE-	-MEASURE-	-MEASURE-	-MEASURE-	-MEASURE-
WCDMA Band IV	1.7526	23.00	200	1.2	0.5	4.2	0.5	0.5	4	1	46	1	1	-MEASURE-	-MEASURE-	-MEASURE-	-MEASURE-	-MEASURE-
LTE Band 2	1.9	23.50	224	1.2	0.5	4.2	0.5	0.5	4	1	46	1	1	-MEASURE-	-MEASURE-	-MEASURE-	-MEASURE-	-MEASURE-
LTE Band 4	1.745	23.00	200	1.2	0.5	4.2	0.5	0.5	4	1	46	1	1	-MEASURE-	-MEASURE-	-MEASURE-	-MEASURE-	-MEASURE-

REQUIRED TEST CONFIGURATIONS

The table below identifies the standalone test configurations required for this device according to the findings in Section 6.1:

Head

Test Configurations	Front
0.3GHz ≤ f < 1.5GHz	
WCDMA Band V	Yes
LTE Band 5	Yes
LTE Band 12	Yes
LTE Band 13	Yes
1.5GHz ≤ f ≤ 6GHz	
WCDMA Band Ⅱ	Yes
WCDMA Band Ⅳ	Yes
LTE Band 2	Yes
LTE Band 4	Yes

Extremities

Test Configurations	Rear	Edge1	Edge2	Edge3	Edge4
0.3GHz ≤ f < 1.5GHz					
WCDMA Band V	Yes	Yes	Yes	Yes	Yes
LTE Band 5	Yes	Yes	Yes	Yes	Yes
LTE Band 12	Yes	Yes	Yes	Yes	Yes
LTE Band 13	Yes	Yes	Yes	Yes	Yes
1.5GHz ≤ f ≤ 6GHz					
WCDMA Band Ⅱ	Yes	Yes	Yes	Yes	Yes
WCDMA Band Ⅳ	Yes	Yes	Yes	Yes	Yes
LTE Band 2	Yes	Yes	Yes	Yes	Yes
LTE Band 4	Yes	Yes	Yes	Yes	Yes

Note(s):

Yes = Testing is required.

No = Testing is not required.

7 Dielectric Property Measurements & System Check

7.1 Dielectric Property Measurements

The temperature of the tissue-equivalent medium used during measurement must also be within 18°C to 25°C and within ± 2°C of the temperature when the tissue parameters are characterized.

The dielectric parameters must be measured before the tissue-equivalent medium is used in a series of SAR measurements. The parameters should be re-measured after each 3 – 4 days of use; or earlier if the dielectric parameters can become out of tolerance; for example, when the parameters are marginal at the beginning of the measurement series.

Tissue dielectric parameters were measured at the low, middle and high frequency of each operating frequency range of the test device.

The dielectric constant (εr) and conductivity (σ) of typical tissue-equivalent media recipes are expected to be within ± 5% of the required target values; but for SAR measurement systems that have implemented the SAR error compensation algorithms documented in IEEE Std 1528-2013, to automatically compensate the measured SAR results for deviations between the measured and required tissue dielectric parameters, the tolerance for εr and σ may be relaxed to ± 10%. This is limited to frequencies ≤ 3 GHz.

Tissue Dielectric Parameters

FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz

Target Frequency (MHz)	Head		Body	
	ε_r	σ (S/m)	ε_r	σ (S/m)
150	52.3	0.76	61.9	0.80
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.90	55.2	0.97
900	41.5	0.97	55.0	1.05
915	41.5	0.98	55.0	1.06
1450	40.5	1.20	54.0	1.30
1610	40.3	1.29	53.8	1.40
1800 – 2000	40.0	1.40	53.3	1.52
2450	39.2	1.80	52.7	1.95
3000	38.5	2.40	52.0	2.73
5000	36.2	4.45	49.3	5.07
5100	36.1	4.55	49.1	5.18
5200	36.0	4.66	49.0	5.30
5300	35.9	4.76	48.9	5.42
5400	35.8	4.86	48.7	5.53
5500	35.6	4.96	48.6	5.65
5600	35.5	5.07	48.5	5.77
5700	35.4	5.17	48.3	5.88
5800	35.3	5.27	48.2	6.00

IEEE Std 1528-2013

Refer to Table 3 within the IEEE Std 1528-2013

Typical Composition of Ingredients for Liquid Tissue Phantoms

The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation.

Ingredients (% by weight)	Frequency (MHz)									
	450		835		915		1900		2450	
Tissue Type	**Head**	**Body**	**Head**	**Body**	**Head**	**Body**	**Head**	**Body**	**Head**	**Body**
Water	38.56	51.16	41.45	52.4	41.05	56.0	54.9	40.4	62.7	73.2
Salt (NaCl)	3.95	1.49	1.45	1.4	1.35	0.76	0.18	0.5	0.5	0.04
Sugar	56.32	46.78	56.0	45.0	56.5	41.76	0.0	58.0	0.0	0.0
HEC	0.98	0.52	1.0	1.0	1.0	1.21	0.0	1.0	0.0	0.0
Bactericide	0.19	0.05	0.1	0.1	0.1	0.27	0.0	0.1	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	0.0
DGBE	0.0	0.0	0.0	0.0	0.0	0.0	44.92	0.0	0.0	26.7
Dielectric Constant	43.42	58.0	42.54	56.1	42.0	56.8	39.9	54.0	39.8	52.5
Conductivity (S/m)	0.85	0.83	0.91	0.95	1.0	1.07	1.42	1.45	1.88	1.78

alt: 99^{+}% Pure Sodium Chloride Sugar: 98^{+}% Pure Sucrose
Water: De-ionized, 16 MΩ^{+} resistivity HEC: Hydroxy thyl Cellulose
DGBE: 99^{+}% Di(ethylene glycol) butyl ether, [2-(2-butoxyethoxy)ethanol]
Triton X-100 (ultra-pure): Polyethylene glycol mono [4-(1, 1, 3, 3-tetramethylbutyl)phenyl]ether

Simulating Liquids for 5 GHz, Manufactured by SPEAG

Ingredients	(% by weight)
Water	78
Mineral oil	11
Emulsifiers	9
Additives and Salt	2

Dielectric Property Measurements Results:

Date	Tissue Type	Frequency (MHz)	Relative Permittivity (εr)			Conductivity (σ)		
			Measured	Target	Delta (%)	Measured	Target	Delta (%)
2022/3/15	Head	700	43.13	42.17	2.28	0.85	0.89	-3.95
		750	42.45	41.90	1.31	0.90	0.89	1.24
		810	40.17	41.62	-3.48	0.87	0.90	-2.79
2022/3/14	Head	817	43.32	41.58	4.18	0.87	0.90	-2.67
		835	43.06	41.50	3.76	0.90	0.90	-0.33
		850	43.01	41.50	3.64	0.91	0.92	-0.76
2022/3/10	Head	1710	40.36	40.14	0.55	1.29	1.35	-4.45
		1750	40.35	40.10	0.62	1.31	1.37	-4.67
		1760	40.33	40.08	0.62	1.31	1.38	-4.72
2022/3/11	Head	1710	40.49	40.14	0.87	1.29	1.35	-4.08
		1750	40.47	40.10	0.92	1.31	1.37	-4.45
		1760	40.45	40.08	0.92	1.31	1.38	-4.51
2022/3/9	Head	1850	40.16	40.00	0.40	1.35	1.40	-3.43
		1900	40.10	40.00	0.25	1.38	1.40	-1.79
		1920	40.11	40.00	0.27	1.39	1.40	-1.07
2022/3/10	Head	1850	40.05	40.00	0.12	1.35	1.40	-3.64
		1900	40.00	40.00	0.00	1.37	1.40	-2.00
		1920	40.01	40.00	0.02	1.38	1.40	-1.36

7.2 System Check

SAR system verification is required to confirm measurement accuracy, according to the tissue dielectric media, probe calibration points and other system operating parameters required for measuring the SAR of a test device. The system verification must be performed for each frequency band and within the valid range of each probe calibration point required for testing the device. The same SAR probe(s) and tissue-equivalent media combinations used with each specific SAR system for system verification must be used for device testing. When multiple probe calibration points are required to cover substantially large transmission bands, independent system verifications are required for each probe calibration point. A system verification must be performed before each series of SAR measurements using the same probe calibration point and tissue-equivalent medium. Additional system verification should be considered according to the conditions of the tissue-equivalent medium and measured tissue dielectric parameters, typically every three to four days when the liquid parameters are re-measured or sooner when marginal liquid parameters are used at the beginning of a series of measurements.

System Performance Check Measurement Conditions

- The measurements were performed in the flat section of the TWIN SAM or ELI phantom, shell thickness: 2.0 ±0.2 mm (bottom plate) filled with Body or Head simulating liquid of the following parameters.
- The depth of tissue-equivalent liquid in a phantom must be ≥ 15.0 cm for SAR measurements ≤ 3 GHz and ≥ 10.0 cm for measurements > 3 GHz.
- The DASY system with an E-Field Probe was used for the measurements.
- The dipole was mounted on the small tripod so that the dipole feed point was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 15 mm (below 1 GHz) and 10 mm (above 1 GHz) from dipole center to the simulating liquid surface.
- The coarse grid with a grid spacing of 15 mm was aligned with the dipole.
  For 5 GHz band - The coarse grid with a grid spacing of 10 mm was aligned with the dipole.
- Special 7x7x7 (below 3 GHz) and/or 8x8x7 (above 3 GHz) fine cube
- Distance between probe sensors and phantom surface was set to 2 mm.
- The dipole input power (forward power) was 250 mW (below 2GHz) and 100 mW
- The results are normalized to 1 W input power.

System Check Results

The 1-g and 10-g SAR measured with a reference dipole, using the required tissue-equivalent medium at the test frequency, must be within ±10% of the manufacturer calibrated dipole SAR target. Refer to Appendix 2 for the SAR System Check Plots.

Date	Tissue Type	Dipole S/N	Input Power (mW)	Measured 1g SAR (W/kg)	Targeted 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Delta 1g ±10 (%)	Measured 10g SAR (W/kg)	Targeted 10g SAR (W/kg)	Normalized 10g SAR (W/kg)	Delta 10g ±10 (%)	Plot No.
2022/3/15	Head	D750V3-1078	250	2.31	8.58	9.24	7.69	1.48	5.59	5.92	5.90	1
2022/3/14	Head	D835V2-4d166	250	2.58	9.49	10.32	8.75	1.64	6.25	6.56	4.96	2
2022/3/10	Head	D1750V2-1008	250	8.77	36.60	35.08	-4.15	4.54	19.20	18.16	-5.42	3
2022/3/11	Head	D1750V2-1008	250	9.02	36.60	36.08	-1.42	4.68	19.20	18.72	-2.50	4
2022/3/9	Head	D1900V2-5d173	250	9.05	39.30	36.2	-7.89	4.67	20.50	18.68	-8.88	5
2022/3/10	Head	D1900V2-5d173	250	10.50	39.30	42	6.87	5.41	20.50	21.64	5.56	6

8 Conducted Output Power Measurements

8.1 W-CDMA

Release 99 Setup Procedures used to establish the test signals

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 specification. The DUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7).

Mode	Subtest	Rel99
WCDMA General Settings	Loopback Mode	Test Mode 2
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm2
	βc/βd	8/15

HSDPA Setup Procedures used to establish the test signals

The following 4 Sub-tests were completed according to Release 5 procedures in table C.10.1.4 of 3GPP TS 34.121-1 A summary of these settings are illustrated below:

	Mode	HSDPA	HSDPA	HSDPA	HSDPA
	Subtest	1	2	3	4
W-CDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set 1			
	Power Control Algorithm	Algorithm 2			
	βc	2/15	11/15	15/15	15/15
	βd	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	βc/βd	2/15	11/15	15/8	15/4
	βhs	4/15	24/15	30/15	30/15
	MPR (dB)	0	0	0.5	0.5
HSDPA Specific Settings	D_{ACK}	8			
	D_{NAK}	8			
	DCQI	8			
	Ack-Nack repetition factor	3			
	CQI Feedback (Table 5.2B.4)	4ms			
	CQI Repetition Factor (Table 5.2B.4)	2			
	Ahs=βhs/βc	30/15			

HSPA (HSDPA & HSUPA) Setup Procedures used to establish the test signals

The following 5 Sub-tests were completed according to Release 6 procedures in table C,11.1.3 of 3GPP TS 34.121-1 v13.
A summary of these settings are illustrated below:

	Mode	HSPA				
	Subtest	1	2	3	4	5
WCDMA General Settings	Loopback Mode	Test Mode 1				
	Rel99 RMC	12.2 kbps RMC				
	HSDPA FRC	H-Set 1				
	HSUPA Test	HSPA				
	Power Control Algorithm	Algorithm 2				Algorithm 1
	βc	11/15	6/15	15/15	2/15	15/15
	βd	15/15	15/15	9/15	15/15	0
	βec	209/225	12/15	30/15	2/15	5/15
	βc/βd	11/15	6/15	15/9	2/15	-
	βhs	22/15	12/15	30/15	4/15	5/15
	βed	1309/225	94/75	47/15	56/75	47/15
	CM (dB)	1	3	2	3	1
	MPR (dB)	0	2	1	2	0
HSDPA Specific Settings	DACK	8				0
	DNAK	8				0
	DCQI	8				0
	Ack-Nack repetition factor	3				
	CQI Feedback (Table 5.2B.4)	4ms				
	CQI Repetition Factor (Table 5.2B.4)	2				
	Ahs = βhs/βc	30/15				
HSUPA Specific Settings	E-DPDCCH	6	8	8	5	0
	DHARQ	0	0	0	0	0
	AG Index	20	12	15	17	12
	ETFCI (from 34.121 Table C.11.1.3)	75	67	92	71	67
	Associated Max UL Data Rate kbps	242.1	174.9	482.8	205.8	308.9
	Reference E-TFCIs	5	5	2	5	1
	Reference E-TFCI	11	11	11	11	67
	Reference E-TFCI PO	4	4	4	4	18
	Reference E-TFCI	67	67	92	67	67
	Reference E-TFCI PO	18	18	18	18	18
	Reference E-TFCI	71	71	71	71	71
	Reference E-TFCI PO	23	23	23	23	23
	Reference E-TFCI	75	75	75	75	75
	Reference E-TFCI PO	26	26	26	26	26
	Reference E-TFCI	81	81	81	81	81
	Reference E-TFCI PO	27	27	27	27	27
	Maximum Channelization Codes	2xSF2				SF4

W-CDMA Band II Measured Results

Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Max. Meas. Avg Pwr (dBm)	Tune-up Limit
W-CDMA Band II	Rel 99	RMC, 12.2 kbps	9262	1852.4	N/A	22.81	23.0
			9400	1880.0	N/A	22.43	
			9538	1907.6	N/A	21.69	
	HSDPA	Subtest 1	9262	1852.4	0	22.34	23.0
			9400	1880.0	0	21.79	
			9538	1907.6	0	21.02	
		Subtest 2	9262	1852.4	0	22.40	23.0
			9400	1880.0	0	22.04	
			9538	1907.6	0	21.18	
		Subtest 3	9262	1852.4	0.5	21.31	22.5
			9400	1880.0	0.5	21.29	
			9538	1907.6	0.5	20.83	
		Subtest 4	9262	1852.4	0.5	21.30	22.5
			9400	1880.0	0.5	21.31	
			9538	1907.6	0.5	20.75	
	HSUPA	Subtest 1	9262	1852.4	0	22.76	23.0
			9400	1880.0	0	22.32	
			9538	1907.6	0	21.73	
		Subtest 2	9262	1852.4	2	20.93	21.0
			9400	1880.0	2	20.75	
			9538	1907.6	2	20.45	
		Subtest 3	9262	1852.4	1	20.27	22.0
			9400	1880.0	1	20.81	
			9538	1907.6	1	20.21	
		Subtest 4	9262	1852.4	2	20.89	21.0
			9400	1880.0	2	20.79	
			9538	1907.6	2	20.42	
		Subtest 5	9262	1852.4	0	22.74	23.0
			9400	1880.0	0	22.41	
			9538	1907.6	0	21.67	

W-CDMA Band IV Measured Results

Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Max. Meas. Avg Pwr (dBm)	Tune-up Limit
W-CDMA Band IV	Rel 99	RMC, 12.2 kbps	1312	1712.4	N/A	22.62	23.0
			1413	1732.6	N/A	22.49	
			1513	1752.6	N/A	22.74	
	HSDPA	Subtest 1	1312	1712.4	0	22.16	23.0
			1413	1732.6	0	22.30	
			1513	1752.6	0	22.42	
		Subtest 2	1312	1712.4	0	22.32	23.0
			1413	1732.6	0	22.45	
			1513	1752.6	0	22.56	
		Subtest 3	1312	1712.4	0.5	21.83	22.5
			1413	1732.6	0.5	21.76	
			1513	1752.6	0.5	21.68	
		Subtest 4	1312	1712.4	0.5	21.71	22.5
			1413	1732.6	0.5	21.64	
			1513	1752.6	0.5	21.80	
	HSUPA	Subtest 1	1312	1712.4	0	22.11	23.0
			1413	1732.6	0	22.23	
			1513	1752.6	0	22.17	
		Subtest 2	1312	1712.4	2	20.86	21.0
			1413	1732.6	2	20.91	
			1513	1752.6	2	20.89	
		Subtest 3	1312	1712.4	1	21.73	22.0
			1413	1732.6	1	21.97	
			1513	1752.6	1	21.88	
		Subtest 4	1312	1712.4	2	20.79	21.0
			1413	1732.6	2	20.92	
			1513	1752.6	2	20.86	
		Subtest 5	1312	1712.4	0	22.12	23.0
			1413	1732.6	0	22.19	
			1513	1752.6	0	22.21	

W-CDMA Band V Measured Results

Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Max. Meas. Avg Pwr (dBm)	Tune-up Limit
W-CDMA Band V	Rel 99	RMC, 12.2 kbps	4132	826.4	N/A	23.32	24.0
			4183	836.6	N/A	23.54	
			4233	846.6	N/A	23.51	
	HSDPA	Subtest 1	4132	826.4	0	23.12	24.0
			4183	836.6	0	23.11	
			4233	846.6	0	23.13	
		Subtest 2	4132	826.4	0	23.07	24.0
			4183	836.6	0	23.04	
			4233	846.6	0	23.16	
		Subtest 3	4132	826.4	0.5	22.45	23.5
			4183	836.6	0.5	22.46	
			4233	846.6	0.5	22.55	
		Subtest 4	4132	826.4	0.5	22.38	23.5
			4183	836.6	0.5	22.40	
			4233	846.6	0.5	22.57	
	HSUPA	Subtest 1	4132	826.4	0	22.26	24.0
			4183	836.6	0	22.28	
			4233	846.6	0	22.14	
		Subtest 2	4132	826.4	2	21.94	22.0
			4183	836.6	2	21.87	
			4233	846.6	2	21.81	
		Subtest 3	4132	826.4	1	22.61	23.0
			4183	836.6	1	22.56	
			4233	846.6	1	22.53	
		Subtest 4	4132	826.4	2	21.79	22.0
			4183	836.6	2	21.87	
			4233	846.6	2	21.81	
		Subtest 5	4132	826.4	0	22.91	24.0
			4183	836.6	0	22.87	
			4233	846.6	0	22.84	

8.2 LTE

The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS36.101 specification.

UE Power Class: 3 (23 +/- 2dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101.

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3

Modulation	Channel bandwidth / Transmission bandwidth (N_{RB})						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2
64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2
64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3
256 QAM	≥ 1						≤ 5

The allowed A-MPR values specified below in Table 6.2.4.-1 of 3GPP TS36.101 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signaling Value of “NS_01”.

Table 6.2.4-1: Additional Maximum Power Reduction (A-MPR)

Network Signalling value	Requirements (subclause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N_{RB})	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	N/A

LTE Band 2 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Meas. Avg Pwr (dBm)			Tune-up Limit
						18700	18900	19100	
						1860 MHz	1880 MHz	1900 MHz	
LTE Band 2	20	QPSK	1	0	0	22.99	22.72	22.21	23.5
			1	49	0	23.06	22.81	22.73	23.5
			1	99	0	22.39	22.36	22.32	23.5
			50	0	1	21.54	21.59	21.47	22.5
			50	24	1	21.43	21.47	21.41	22.5
			50	50	1	21.51	21.30	21.36	22.5
			100	0	1	21.71	21.45	21.52	22.5
		16QAM	1	0	1	20.94	20.91	20.93	22.5
			1	49	1	20.83	20.97	20.95	22.5
			1	99	1	20.74	20.89	20.86	22.5
Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Meas. Avg Pwr (dBm)			Tune-up Limit
						18675	18900	19125	
						1857.5 MHz	1880 MHz	1902.5 MHz	
LTE Band 2	15	QPSK	1	0	0	22.84	22.27	22.34	23.5
			1	37	0	22.90	22.72	22.27	23.5
			1	74	0	22.19	22.65	22.43	23.5
			36	0	1	21.98	21.69	21.73	22.5
			36	20	1	21.93	21.62	21.69	22.5
			36	39	1	21.84	21.48	21.76	22.5
			75	0	1	21.92	21.73	21.63	22.5
		16QAM	1	0	1	20.94	20.96	20.91	22.5
			1	37	1	20.88	20.91	20.95	22.5
			1	74	1	20.83	20.98	20.79	22.5
Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Meas. Avg Pwr (dBm)			Tune-up Limit
						18650	18900	19150	
						1855 MHz	1880 MHz	1905 MHz	
LTE Band 2	10	QPSK	1	0	0	22.76	22.83	22.72	23.5
			1	25	0	22.79	22.81	22.78	23.5
			1	49	0	22.39	22.36	22.41	23.5
			25	0	1	21.63	21.67	21.63	22.5
			25	12	1	21.33	21.23	21.26	22.5
			25	25	1	21.30	21.41	21.44	22.5
			50	0	1	21.42	21.39	21.37	22.5
		16QAM	1	0	1	20.91	20.89	20.86	22.5
			1	25	1	20.79	20.87	20.85	22.5
			1	49	1	20.97	20.76	20.91	22.5

LTE Band 2 Measured Results (continued)

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Meas. Avg Pwr (dBm)			Tune-up Limit
						18625	18900	19175	
						1852.5 MHz	1880 MHz	1907.5 MHz	
LTE Band 2	5	QPSK	1	0	0	22.86	22.73	22.75	23.5
			1	12	0	22.98	22.67	22.79	23.5
			1	24	0	22.78	22.74	22.63	23.5
			12	0	1	21.82	21.62	21.77	22.5
			12	7	1	21.85	21.58	21.69	22.5
			12	13	1	21.70	21.65	21.63	22.5
			25	0	1	21.77	21.57	21.52	22.5
		16QAM	1	0	1	20.93	20.89	20.69	22.5
			1	12	1	20.86	20.75	20.67	22.5
			1	24	1	20.88	20.84	20.64	22.5
Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Meas. Avg Pwr (dBm)			Tune-up Limit
						18615	18900	19185	
						1851.5 MHz	1880 MHz	1908.5 MHz	
LTE Band 2	3	QPSK	1	0	0	22.87	22.53	22.62	23.5
			1	8	0	22.82	22.49	22.58	23.5
			1	14	0	22.77	22.40	22.59	23.5
			8	0	1	21.78	21.45	21.36	22.5
			8	4	1	21.81	21.42	21.30	22.5
			8	7	1	21.79	21.37	21.16	22.5
			15	0	1	21.78	21.36	21.13	22.5
		16QAM	1	0	1	20.94	20.91	20.87	22.5
			1	8	1	20.92	20.83	20.85	22.5
			1	14	1	20.87	20.76	20.66	22.5
Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Meas. Avg Pwr (dBm)			Tune-up Limit
						18607	18900	19193	
						1850.7 MHz	1880 MHz	1909.3 MHz	
LTE Band 2	1.4	QPSK	1	0	0	22.66	22.32	22.28	23.5
			1	3	0	22.76	22.38	22.34	23.5
			1	5	0	22.62	22.19	22.13	23.5
			3	0	0	22.65	22.28	22.10	22.5
			3	1	0	22.69	22.34	22.11	22.5
			3	3	0	22.63	22.26	22.06	22.5
			6	0	1	21.75	21.16	21.13	22.5
		16QAM	1	0	1	20.92	20.97	20.81	22.5
			1	3	1	20.89	20.93	20.69	22.5
			1	5	1	20.86	20.81	20.57	22.5

LTE Band 4 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Meas. Avg Pwr (dBm)			Tune-up Limit
						20050	20175	20300	
						1720 MHz	1732.5 MHz	1745 MHz	
LTE Band 4	20	QPSK	1	0	0	22.38	21.95	22.35	23.0
			1	49	0	22.41	21.94	22.31	23.0
			1	99	0	22.32	21.88	22.02	23.0
			50	0	1	21.36	20.69	21.18	22.0
			50	24	1	21.19	21.26	21.02	22.0
			50	50	1	21.05	21.30	20.18	22.0
			100	0	1	21.11	21.15	20.98	22.0
		16QAM	1	0	1	20.82	20.95	20.93	22.0
			1	49	1	20.99	20.99	20.96	22.0
			1	99	1	20.79	20.86	20.81	22.0
Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Meas. Avg Pwr (dBm)			Tune-up Limit
						20025	20175	20325	
						1717.5 MHz	1732.5 MHz	1747.5 MHz	
LTE Band 4	15	QPSK	1	0	0	22.02	21.99	22.19	23.0
			1	37	0	21.94	21.93	22.07	23.0
			1	74	0	21.73	21.85	21.93	23.0
			36	0	1	20.80	20.79	20.78	22.0
			36	20	1	20.59	20.80	20.66	22.0
			36	39	1	20.56	20.92	20.84	22.0
			75	0	1	20.67	20.84	20.83	22.0
		16QAM	1	0	1	20.55	20.52	20.75	22.0
			1	37	1	20.76	20.58	20.80	22.0
			1	74	1	20.29	20.78	20.84	22.0
Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Meas. Avg Pwr (dBm)			Tune-up Limit
						20000	20175	20350	
						1715 MHz	1732.5 MHz	1750 MHz	
LTE Band 4	10	QPSK	1	0	0	22.30	22.33	22.38	23.0
			1	25	0	22.36	22.36	22.29	23.0
			1	49	0	22.22	22.38	22.28	23.0
			25	0	1	21.10	21.10	21.31	22.0
			25	12	1	21.15	21.21	21.28	22.0
			25	25	1	21.11	21.15	21.21	22.0
			50	0	1	21.13	21.07	21.38	22.0
		16QAM	1	0	1	20.83	20.86	20.90	22.0
			1	25	1	20.79	20.74	20.74	22.0
			1	49	1	20.65	20.66	20.95	22.0

LTE Band 4 Measured Results (continued)

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Meas. Avg Pwr (dBm)			Tune-up Limit
						19975	20175	20375	
						1712.5 MHz	1732.5 MHz	1752.5 MHz	
LTE Band 4	5	QPSK	1	0	0	22.03	22.20	22.09	23.0
			1	12	0	22.32	22.11	22.13	23.0
			1	24	0	22.17	22.15	22.16	23.0
			12	0	1	21.71	21.56	21.59	22.0
			12	7	1	21.68	21.37	21.63	22.0
			12	13	1	21.33	21.28	21.36	22.0
			25	0	1	21.14	21.06	21.07	22.0
		16QAM	1	0	1	20.87	20.85	20.82	22.0
			1	12	1	20.54	20.86	20.56	22.0
			1	24	1	20.51	20.90	20.79	22.0
Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Meas. Avg Pwr (dBm)			Tune-up Limit
						19965	20175	20385	
						1711.5 MHz	1732.5 MHz	1753.5 MHz	
LTE Band 4	3	QPSK	1	0	0	22.09	22.28	22.02	23.0
			1	8	0	22.05	22.25	21.99	23.0
			1	14	0	22.24	22.27	22.32	23.0
			8	0	1	20.86	21.06	21.07	22.0
			8	4	1	21.18	21.08	21.04	22.0
			8	7	1	21.07	21.13	21.07	22.0
			15	0	1	21.23	21.68	21.57	22.0
		16QAM	1	0	1	20.95	20.86	20.91	22.0
			1	8	1	20.94	20.96	20.66	22.0
			1	14	1	20.78	20.81	20.58	22.0
Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Meas. Avg Pwr (dBm)			Tune-up Limit
						19957	20175	20393	
						1710.7 MHz	1732.5 MHz	1754.3 MHz	
LTE Band 4	1.4	QPSK	1	0	0	22.23	22.24	22.31	23.0
			1	3	0	22.38	22.33	22.39	23.0
			1	5	0	22.15	22.19	22.33	23.0
			3	0	0	22.14	22.21	22.25	22.0
			3	1	0	22.16	22.27	22.40	22.0
			3	3	0	22.18	22.19	22.22	22.0
			6	0	1	21.04	21.44	21.05	22.0
		16QAM	1	0	1	20.94	20.96	20.85	22.0
			1	3	1	20.93	20.98	20.96	22.0
			1	5	1	20.90	20.83	20.78	22.0

LTE Band 5 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Meas. Avg Pwr (dBm)			Tune-up Limit
						20450	20525	20600	
						829 MHz	836.5 MHz	844 MHz	
LTE Band 5	10	QPSK	1	0	0	23.47	23.49	23.43	24.0
			1	25	0	23.45	23.36	23.41	24.0
			1	49	0	23.44	23.31	23.38	24.0
			25	0	1	22.32	22.52	22.45	23.0
			25	12	1	22.31	22.46	22.48	23.0
			25	25	1	22.39	22.34	22.37	23.0
			50	0	1	22.45	22.49	22.25	23.0
		16QAM	1	0	1	22.83	22.25	22.26	23.0
			1	25	1	22.52	22.24	22.18	23.0
			1	49	1	22.38	22.31	22.21	23.0
Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Meas. Avg Pwr (dBm)			Tune-up Limit
						20425	20525	20625	
						826.5 MHz	836.5 MHz	846.5 MHz	
LTE Band 5	5	QPSK	1	0	0	23.41	23.43	23.36	24.0
			1	12	0	23.36	23.33	23.29	24.0
			1	24	0	23.13	23.36	23.28	24.0
			12	0	1	22.21	22.15	22.17	23.0
			12	7	1	22.29	22.25	22.19	23.0
			12	13	1	22.28	22.19	22.22	23.0
			25	0	1	22.23	22.17	22.14	23.0
		16QAM	1	0	1	22.14	22.18	22.09	23.0
			1	12	1	21.93	21.94	21.94	23.0
			1	24	1	21.86	21.73	21.79	23.0
Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Meas. Avg Pwr (dBm)			Tune-up Limit
						20415	20525	20635	
						825.5 MHz	836.5 MHz	847.5 MHz	
LTE Band 5	3	QPSK	1	0	0	23.18	23.26	23.11	24.0
			1	8	0	23.10	23.12	23.06	24.0
			1	14	0	23.14	23.20	23.15	24.0
			8	0	1	22.16	22.15	22.08	23.0
			8	4	1	22.15	22.16	22.10	23.0
			8	7	1	22.18	22.23	22.09	23.0
			15	0	1	22.17	22.11	22.14	23.0
		16QAM	1	0	1	21.91	21.83	21.69	23.0
			1	8	1	21.79	21.75	21.67	23.0
			1	14	1	21.64	21.59	21.72	23.0

LTE Band 5 Measured Results (continued)

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Meas. Avg Pwr (dBm)			Tune-up Limit
						20407	20525	20643	
						824.7 MHz	836.5 MHz	848.3 MHz	
LTE Band 5	1.4	QPSK	1	0	0	23.30	23.24	23.47	24.0
			1	3	0	23.42	23.31	23.32	24.0
			1	5	0	23.41	23.12	22.78	24.0
			3	0	0	22.95	22.89	22.88	23.0
			3	1	0	22.94	22.88	22.84	23.0
			3	3	0	22.92	22.82	21.88	23.0
			6	0	1	22.41	22.34	22.38	23.0
		16QAM	1	0	1	22.08	22.15	22.12	23.0
			1	3	1	22.06	22.05	22.09	23.0
			1	5	1	21.98	22.03	22.04	23.0

LTE Band 12 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Meas. Avg Pwr (dBm)			Tune-up Limit
						23060	23095	23130	
						704 MHz	707.5 MHz	711 MHz	
LTE Band 12	10	QPSK	1	0	0	23.40	23.43	23.45	24.0
			1	25	0	23.83	23.84	23.87	24.0
			1	49	0	23.56	23.56	23.37	24.0
			25	0	1	22.53	22.66	22.83	23.0
			25	12	1	22.50	22.60	22.51	23.0
			25	25	1	22.44	22.59	22.41	23.0
			50	0	1	22.39	22.62	22.55	23.0
		16QAM	1	0	1	22.05	22.07	21.97	23.0
			1	25	1	22.14	22.16	22.01	23.0
			1	49	1	21.83	21.78	21.73	23.0
Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Meas. Avg Pwr (dBm)			Tune-up Limit
						23035	23095	23155	
						701.5 MHz	707.5 MHz	713.5 MHz	
LTE Band 12	5	QPSK	1	0	0	23.28	23.43	23.22	24.0
			1	12	0	23.61	23.49	23.30	24.0
			1	24	0	23.53	23.45	23.28	24.0
			12	0	1	22.27	22.46	22.27	23.0
			12	7	1	22.23	22.44	22.24	23.0
			12	13	1	22.13	22.48	22.27	23.0
			25	0	1	22.15	22.43	22.33	23.0
		16QAM	1	0	1	21.94	21.83	21.88	23.0
			1	12	1	21.95	21.71	21.94	23.0
			1	24	1	21.76	21.55	21.76	23.0

LTE Band 12 Measured Results (continued)

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Meas. Avg Pwr (dBm)			Tune-up Limit
						23025	23095	23165	
						700.5 MHz	707.5 MHz	714.5 MHz	
LTE Band 12	3	QPSK	1	0	0	23.40	23.42	23.36	24.0
			1	8	0	23.28	23.51	23.43	24.0
			1	14	0	23.39	23.35	23.24	24.0
			8	0	1	22.39	22.34	22.24	23.0
			8	4	1	22.32	22.39	22.38	23.0
			8	7	1	22.36	22.41	22.32	23.0
			15	0	1	22.48	22.33	22.19	23.0
		16QAM	1	0	1	21.94	21.98	21.87	23.0
			1	8	1	21.73	21.95	21.71	23.0
			1	14	1	21.86	21.89	21.74	23.0
Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Meas. Avg Pwr (dBm)			Tune-up Limit
						23017	23095	23173	
						699.7 MHz	707.5 MHz	715.3 MHz	
LTE Band 12	1.4	QPSK	1	0	0	23.16	23.41	23.24	24.0
			1	3	0	23.32	23.43	23.41	24.0
			1	5	0	23.25	23.31	23.33	24.0
			3	0	0	22.91	22.83	22.78	23.0
			3	1	0	22.77	22.77	22.82	23.0
			3	3	0	22.72	22.73	22.74	23.0
			6	0	1	22.19	22.23	22.27	23.0
		16QAM	1	0	1	21.92	21.89	21.91	23.0
			1	3	1	21.82	21.87	21.82	23.0
			1	5	1	21.94	21.82	21.87	23.0

LTE Band 13 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Meas. Avg Pwr (dBm)			Tune-up Limit
							23230		
							782 MHz		
LTE Band 13	10	QPSK	1	0	0		23.71		24.0
			1	25	0		23.62		24.0
			1	49	0		23.73		24.0
			25	0	1		22.44		23.0
			25	12	1		22.51		23.0
			25	25	1		22.72		23.0
			50	0	1		22.55		23.0
		16QAM	1	0	1		21.88		23.0
			1	25	1		21.93		23.0
			1	49	1		21.82		23.0

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Meas. Avg Pwr (dBm)			Tune-up Limit
						23205	23230	23255	
						779.5 MHz	782 MHz	784.5 MHz	
LTE Band 13	5	QPSK	1	0	0	23.70	23.39	23.49	24.0
			1	12	0	23.68	23.67	23.68	24.0
			1	24	0	23.39	23.62	23.67	24.0
			12	0	1	22.43	22.39	22.48	23.0
			12	7	1	22.42	22.63	22.45	23.0
			12	13	1	22.48	22.82	22.39	23.0
			25	0	1	22.48	22.36	22.37	23.0
		16QAM	1	0	1	21.77	21.78	21.74	23.0
			1	12	1	21.68	21.72	21.73	23.0
			1	24	1	21.61	21.66	21.68	23.0

9 Measured and Reported (Scaled) SAR Results

9.1 W-CDMA Band II

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Accessory	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		10-g SAR (W/kg)		Plot No.
							Tune-up Limit	Meas.	Meas.	Scaled	Meas.	Scaled	
Head	RMC, 12.2 kbps	15	Front surface	-	9262	1852.4	23.0	22.81	0.641	**0.670**	0.383	0.400	1
			Front surface	Belt Clip	9262	1852.4	23.0	22.81	0.543	0.567	0.328	0.343	

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Accessory	Ch #.	Freq. (MHz)	Power (dBm)		10-g SAR (W/kg)		Plot No.
							Tune-up Limit	Meas.	Meas.	Scaled	
Extremity	RMC, 12.2 kbps	0	Rear	-	9262	1852.4	23.0	22.81	1.640	1.713	
			Edge 1	-	9262	1852.4	23.0	22.81	0.288	0.301	
			Edge 2	-	9262	1852.4	23.0	22.81	1.660	1.734	
			Edge 3	-	9262	1852.4	23.0	22.81	2.620	2.737	
			Edge 3	-	9400	1880.0	23.0	22.43	2.690	**3.067**	2
			Edge 3	Belt Clip	9400	1880.0	23.0	22.43	2.670	3.044	
			Edge 3	-	9538	1907.6	23.0	21.69	1.980	2.677	
			Edge 4	-	9262	1852.4	23.0	22.81	0.143	0.149	

9.2 W-CDMA Band IV

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Accessory	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		10-g SAR (W/kg)		Plot No.
							Tune-up Limit	Meas.	Meas.	Scaled	Meas.	Scaled	
Head	RMC, 12.2 kbps	15	Front surface	-	1513	1752.6	23.0	22.74	0.322	**0.342**	0.195	0.207	3
			Front surface	Belt Clip	1513	1752.6	23.0	22.74	0.151	0.160	0.093	0.098	

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Accessory	Ch #.	Freq. (MHz)	Power (dBm)		10-g SAR (W/kg)		Plot No.
							Tune-up Limit	Meas.	Meas.	Scaled	
Extremity	RMC, 12.2 kbps	0	Rear	-	1513	1752.6	23.0	22.74	0.965	1.025	
			Edge 1	-	1513	1752.6	23.0	22.74	0.149	0.158	
			Edge 2	-	1513	1752.6	23.0	22.74	1.030	1.094	
			Edge 3	-	1513	1752.6	23.0	22.74	1.490	**1.582**	4
			Edge 3	Belt Clip	1513	1752.6	23.0	22.74	1.470	1.561	
			Edge 4	-	1513	1752.6	23.0	22.74	0.075	0.080	

9.3 W-CDMA Band V

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Accessory	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		10-g SAR (W/kg)		Plot No.
							Tune-up Limit	Meas.	Meas.	Scaled	Meas.	Scaled	
Head	RMC, 12.2 kbps	15	Front surface	-	4183	836.6	24.0	23.54	0.198	**0.220**	0.117	0.130	5
			Front surface	Belt Clip	4183	836.6	24.0	23.54	0.092	0.102	0.056	0.062	

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Accessory	Ch #.	Freq. (MHz)	Power (dBm)		10-g SAR (W/kg)		Plot No.
							Tune-up Limit	Meas.	Meas.	Scaled	
Extremity	RMC, 12.2 kbps	0	Rear	-	4183	836.6	24.0	23.54	0.401	0.446	
			Edge 1	-	4183	836.6	24.0	23.54	0.549	**0.610**	6
			Edge 1	Belt Clip	4183	836.6	24.0	23.54	0.539	0.599	
			Edge 2	-	4183	836.6	24.0	23.54	0.441	0.490	
			Edge 3	-	4183	836.6	24.0	23.54	0.253	0.281	
			Edge 4	-	4183	836.6	24.0	23.54	0.177	0.197	

9.4 LTE Band 2 (20MHz Bandwidth)

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Accessory	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		10-g SAR (W/kg)		Plot No.
									Tune-up Limit	Meas.	Meas.	Scaled	Meas.	Scaled	
Head	QPSK	15	Front surface	-	18700	1860.0	1	49	23.5	23.06	0.432	**0.478**	0.253	0.280	7
			Front surface	Belt Clip			1	49	23.5	23.06	0.110	0.122	0.066	0.073	
			Front surface	-			50	0	22.5	21.54	0.318	0.397	0.187	0.233	

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Accessory	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		10-g SAR (W/kg)		Plot No.
									Tune-up Limit	Meas.	Meas.	Scaled	
Extremity	QPSK	0	Rear	-	18700	1860.0	1	49	23.5	23.06	1.680	1.859	
			Rear	-			50	0	22.5	21.54	1.230	1.534	
			Edge 1	-	18700	1860.0	1	49	23.5	23.06	0.336	0.372	
			Edge 1	-			50	0	22.5	21.54	0.258	0.322	
			Edge 2	-	18700	1860.0	1	49	23.5	23.06	1.650	1.826	
			Edge 2	-			50	0	22.5	21.54	1.190	1.484	
			Edge 3	-	18700	1860.0	1	49	23.5	23.06	2.170	**2.401**	8
			Edge 3	Belt Clip			1	49	23.5	23.06	2.160	2.390	
			Edge 3	-			50	0	22.5	21.54	1.650	2.058	
			Edge 3	-			100	0	22.5	21.71	1.640	1.967	
			Edge 3	-	18900	1880.0	1	49	23.5	22.81	1.900	2.227	
			Edge 3	-			50	0	22.5	21.59	1.590	1.961	
			Edge 3	-	19100	1900.0	1	49	23.5	22.73	1.420	1.695	
			Edge 3	-			50	0	22.5	21.47	1.180	1.496	
			Edge 4	-	18700	1860.0	1	49	23.5	23.06	0.127	0.141	
			Edge 4	-			50	0	22.5	21.54	0.098	0.122	

9.5 LTE Band 4 (20MHz Bandwidth)

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Accessory	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		10-g SAR (W/kg)		Plot No.
									Tune-up Limit	Meas.	Meas.	Scaled	Meas.	Scaled	
Head	QPSK	15	Front surface	-	20050	1720.0	1	49	23.0	22.41	0.027	0.031	0.016	0.018	
			Front surface	-			50	0	22.0	21.36	0.095	**0.110**	0.059	0.068	9
			Front surface	Belt Clip			50	0	22.0	21.36	0.062	0.071	0.038	0.044	

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Accessory	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		10-g SAR (W/kg)		Plot No.
									Tune-up Limit	Meas.	Meas.	Scaled	
Extremity	QPSK	0	Rear	-	20050	1720.0	1	49	23.0	22.41	0.723	0.828	
			Rear	-			50	0	22.0	21.36	0.568	0.658	
			Edge 1	-	20050	1720.0	1	49	23.0	22.41	0.118	0.135	
			Edge 1	-			50	0	22.0	21.36	0.083	0.096	
			Edge 2	-	20050	1720.0	1	49	23.0	22.41	0.758	0.868	
			Edge 2	-			50	0	22.0	21.36	0.616	0.714	
			Edge 3	-	20050	1720.0	1	49	23.0	22.41	1.020	**1.168**	10
			Edge 3	Belt Clip			1	49	23.0	22.41	1.010	1.157	
			Edge 3	-			50	0	22.0	21.36	0.845	0.979	
			Edge 4	-	20050	1720.0	1	49	23.0	22.41	0.058	0.066	
			Edge 4	-			50	0	22.0	21.36	0.045	0.052	

9.6 LTE Band 5 (10MHz Bandwidth)

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Accessory	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		10-g SAR (W/kg)		Plot No.
									Tune-up Limit	Meas.	Meas.	Scaled	Meas.	Scaled	
Head	QPSK	15	Front surface	-	20525	836.5	1	0	24.0	23.49	0.245	**0.276**	0.145	0.163	11
			Front surface	Belt Clip			1	0	24.0	23.49	0.130	0.146	0.077	0.087	
			Front surface	-			25	0	23.0	22.52	0.144	0.161	0.085	0.095	

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Accessory	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		10-g SAR (W/kg)		Plot No.
									Tune-up Limit	Meas.	Meas.	Scaled	
Extremity	QPSK	0	Rear	-	20525	836.5	1	0	24.0	23.49	0.347	0.390	
			Rear	-			25	0	23.0	22.52	0.292	0.326	
			Edge 1	-	20525	836.5	1	0	24.0	23.49	0.465	**0.523**	12
			Edge 1	Belt Clip			1	0	24.0	23.49	0.460	0.517	
			Edge 1	-			25	0	23.0	22.52	0.440	0.491	
			Edge 2	-	20525	836.5	1	0	24.0	23.49	0.339	0.381	
			Edge 2	-			25	0	23.0	22.52	0.291	0.325	
			Edge 3	-	20525	836.5	1	0	24.0	23.49	0.217	0.244	
			Edge 3	-			25	0	23.0	22.52	0.174	0.194	
			Edge 4	-	20525	836.5	1	0	24.0	23.49	0.135	0.152	
			Edge 4	-			25	0	23.0	22.52	0.111	0.124	

9.7 LTE Band 12 (10MHz Bandwidth)

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Accessory	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		10-g SAR (W/kg)		Plot No.
									Tune-up Limit	Meas.	Meas.	Scaled	Meas.	Scaled	
Head	QPSK	15	Front surface	-	23130	711.0	1	25	24.0	23.87	0.027	**0.028**	0.017	0.018	13
			Front surface	Belt Clip			1	25	24.0	23.87	0.021	0.021	0.014	0.014	
			Front surface	-			25	0	23.0	22.83	0.019	0.020	0.012	0.012	

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Accessory	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		10-g SAR (W/kg)		Plot No.
									Tune-up Limit	Meas.	Meas.	Scaled	
Extremity	QPSK	0	Rear	-	23130	711.0	1	25	24.0	23.87	0.061	0.062	
			Rear	-			25	0	23.0	22.83	0.047	0.049	
			Edge 1	-	23130	711.0	1	25	24.0	23.87	0.090	**0.093**	14
			Edge 1	Belt Clip			1	25	24.0	23.87	0.089	0.092	
			Edge 1	-			25	0	23.0	22.83	0.069	0.072	
			Edge 2	-	23130	711.0	1	25	24.0	23.87	0.060	0.062	
			Edge 2	-			25	0	23.0	22.83	0.047	0.049	
			Edge 3	-	23130	711.0	1	25	24.0	23.87	0.089	0.092	
			Edge 3	-			25	0	23.0	22.83	0.065	0.067	
			Edge 4	-	23130	711.0	1	25	24.0	23.87	0.017	0.017	
			Edge 4	-			25	0	23.0	22.83	0.013	0.014	

9.8 LTE Band 13 (10MHz Bandwidth)

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Accessory	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		10-g SAR (W/kg)		Plot No.
									Tune-up Limit	Meas.	Meas.	Scaled	Meas.	Scaled	
Head	QPSK	15	Front surface	-	23230	782.0	1	49	24.0	23.73	0.073	**0.078**	0.047	0.050	15
			Front surface	Belt Clip			1	49	24.0	23.73	0.064	0.068	0.042	0.045	
			Front surface	-			25	25	23.0	22.72	0.053	0.057	0.034	0.036	

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Accessory	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		10-g SAR (W/kg)		Plot No.
									Tune-up Limit	Meas.	Meas.	Scaled	
Extremity	QPSK	0	Rear	-	23230	782.0	1	49	24.0	23.73	0.171	0.182	
			Rear	-			25	25	23.0	22.72	0.129	0.138	
			Edge 1	-	23230	782.0	1	49	24.0	23.73	0.282	**0.300**	16
			Edge 1	Belt Clip			1	49	24.0	23.73	0.280	0.298	
			Edge 1	-			25	25	23.0	22.72	0.223	0.238	
			Edge 2	-	23230	782.0	1	49	24.0	23.73	0.195	0.208	
			Edge 2	-			25	25	23.0	22.72	0.147	0.157	
			Edge 3	-	23230	782.0	1	49	24.0	23.73	0.092	0.098	
			Edge 3	-			25	25	23.0	22.72	0.086	0.092	
			Edge 4	-	23230	782.0	1	49	24.0	23.73	0.034	0.036	
			Edge 4	-			25	25	23.0	22.72	0.026	0.028	

Notes:

1.SAR worst case retest with Belt Clip.

2.The sling accessories are metal free therefor SAR testing is not required.

10 SAR Measurement Variability

In accordance with published RF Exposure KDB 865664 D01 SAR measurement 100 MHz to 6 GHz. These additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

1) Repeated measurement is not required when the original highest measured SAR is <0.8 or 2 W/kg (1-g or 10-g respectively); steps 2) through 4) do not apply.
2) When the original highest measured SAR is ≥ 0.8 or 2 W/kg (1-g or 10-g respectively), repeat that measurement once.
3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 or 3.6 W/kg (~ 10% from the 1-g or 10-g respective SAR limit).
4) Perform a third repeated measurement only if the original, first, or second repeated measurement is ≥ 1.5 or 3.75 W/kg (1-g or 10-g respectively) and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

WCDMA Band II

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Accessory	Ch #.	Freq. (MHz)	Meas. SAR (W/kg)		Largest to Smallest SAR Ratio	**Delta Target ≤ 5%**
							Original	Repeated		
Extremity	RMC, 12.2 kbps	0	Edge 3	-	9400	1880.0	2.690	2.590	1.04	-4%

LTE Band 2

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Accessory	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Meas. SAR (W/kg)		Largest to Smallest SAR Ratio	**Delta Target ≤ 5%**
									Original	Repeated		
Extremity	QPSK	0	Edge 3	-	18700	1860	1	49	2.170	2.150	1.01	-1%

Note(s):

Second Repeated Measurement is not required since the ratio of the largest to smallest SAR for the original and first repeated measurement is < 1.20.

11 Simultaneous Transmission SAR Analysis

KDB 447498 D01 General RF Exposure Guidance provides two procedures for determining simultaneous transmission SAR test exclusion: Sum of SAR and SAR to Peak Location Ratio (SPLSR)

Sum of SAR

To qualify for simultaneous transmission SAR test exclusion based upon Sum of SAR the sum of the reported standalone SARs for all simultaneously transmitting antennas shall be below the applicable standalone SAR limit. If the sum of the SARs is above the applicable limit then simultaneous transmission SAR test exclusion may still apply if the requirements of the SAR to Peak Location Ratio (SPLSR) evaluation are met.

SAR to Peak Location Ratio (SPLSR)

KDB 447498 D01 General RF Exposure Guidance explains how to calculate the SAR to Peak Location Ratio (SPLSR) between pairs of simultaneously transmitting antennas:

$$\mathbf{SPLSR = (SAR_1 + SAR_2)^{1.5} / Ri}$$

Where:

$\mathbf{SAR_1}$ is the highest measured or estimated SAR for the first of a pair of simultaneous transmitting antennas, in a specific test operating mode and exposure condition

$\mathbf{SAR_2}$ is the highest measured or estimated SAR for the second of a pair of simultaneous transmitting antennas, in the same test operating mode and exposure condition as the first

Ri is the separation distance between the pair of simultaneous transmitting antennas. When the SAR is measured, for both antennas in the pair, it is determined by the actual x, y and z coordinates in the 1-g SAR for each SAR peak location, based on the extrapolated and interpolated result in the zoom scan measurement, using the formula of $\mathbf{[(x_1-x_2)^2 + (y_1-y_2)^2 + (z_1-z_2)^2]}$

In order for a pair of simultaneous transmitting antennas with the sum of 1-g SAR > 1.6 W/kg to qualify for exemption from Simultaneous Transmission SAR measurements, it has to satisfy the condition of:

$$\mathbf{(SAR_1 + SAR_2)^{1.5} / Ri \leq 0.04}$$

When an individual antenna transmits at on two bands simultaneously, the sum of the highest reported SAR for the frequency bands should be used to determine SAR1.or SAR2. When SPLSR is necessary, the smallest distance between the peak SAR locations for the antenna pair with respect to the peaks from each antenna should be used.

The antennas in all antenna pairs that do not qualify for simultaneous transmission SAR test exclusion must be tested for SAR compliance, according to the enlarged zoom scan and volume scan post-processing procedures in KDB Publication 865664 D01

Simultaneous Transmission Condition

N/A

12 Equipment List & Calibration Status

The measuring equipment used to perform the tests documented in this report has been calibrated in accordance with the manufacturers' recommendations, and is traceable to recognized national standards.

Dielectric Property Measurements

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Network Analyzer	SPEAG	DAKS_VNA R140	0140417	2023/1/24
Dielectric Assessment Kit	SPEAG	DAKS-3.5	1001	2023/1/26
Thermometer	TES	TES-1306	210801061	2022/10/21

System Check

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Signal Generator	Agilent	N5181A	MY50144143	2022/5/13
Power Meter	Agilent	E4417A	MY52240003	2022/10/26
Power Sensor	Agilent	E9301H	MY52200004	2022/10/24
Power Sensor	Agilent	E9301H	MY51470002	2022/3/22
Dual Directional Coupler(0-2G)	Agilent	778D	MY48220468	2022/9/10
Amplifier	EMCI	ZHL-42	S1900976	N/A
Data Acquisition Electronice	SPEAG	DAE4	1260	2022/9/19
Dosimetric E-Field Probe	SPEAG	EX3DV4	3665	2022/8/24
System Validation Dipole	SPEAG	D750V3	1078	2022/6/21
System Validation Dipole	SPEAG	D835V2	4d166	2022/4/13
System Validation Dipole	SPEAG	D1750V2	1008	2022/10/19
System Validation Dipole	SPEAG	D1900V2	5d173	2022/4/15
Humidity/Temp meter	TECPEL	DTM-303A	TP130074	2022/4/26
Thermometer	TES	TES-1306	210801061	2022/10/21

OTHER

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Wideband Radio Communication Tester	Anritsu	MT-8820C	00000568	2022/12/21

Software Version
DASY NEO52 D10.3 S14.6.13
SEMCAD-X-PostPro

13 Facilities

All measurement facilities used to collect the measurement data are located at

☒ No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan. (R.O.C.)

14 Appendixes

Exhibit	Content
1	SAR Setup Photos
2	SAR System Check Plots
3	Highest SAR Test Plots
4	SAR DAE and Probe Calibration Certificates
5	SAR Dipole Calibration Certificates

END OF REPORT